No. 835,936. PATENTED NOV. 13, 1906.

C. T. CARNAHAN & J. MURPHY.

PNEUMATIC HAMMER.

APPLICATION FILED JUNE 28, 1906.

Fig. 1.

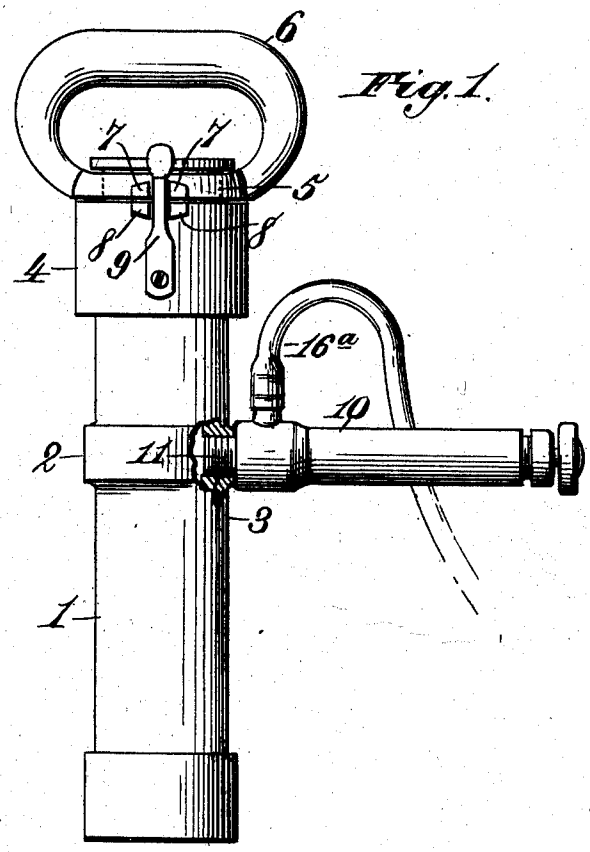
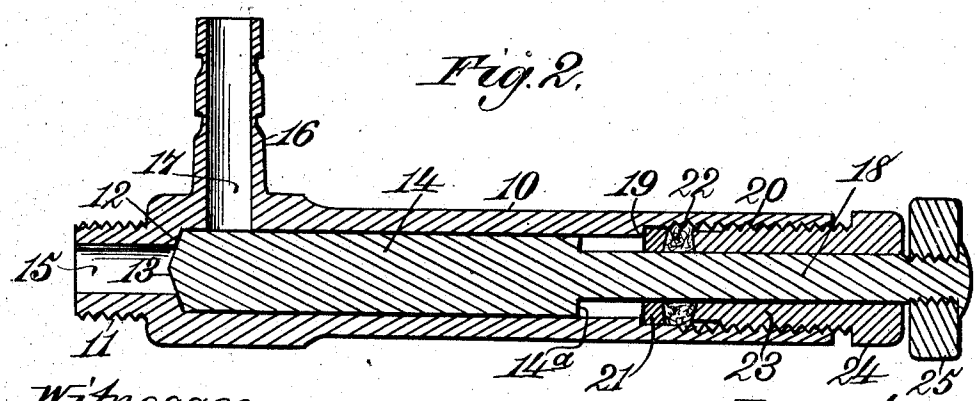


Fig. 2.



Witnesses.
Robt. Everett.
J. B. Keller

Inventors.
Charles T. Carnahan.
Jeremiah Murphy.
By James L. Norris.
Atty.

UNITED STATES PATENT OFFICE.

CHARLES T. CARNAHAN AND JEREMIAH MURPHY, OF DENVER, COLORADO; SAID MURPHY ASSIGNOR TO SAID CARNAHAN.

PNEUMATIC HAMMER.

No. 835,936. Specification of Letters Patent. Patented Nov. 13, 1906.

Application filed June 28, 1906. Serial No. 323,944.

To all whom it may concern:

Be it known that we, CHARLES T. CARNAHAN and JEREMIAH MURPHY, citizens of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented new and useful Improvements in Pneumatic Hammers, of which the following is a specification.

This invention relates to pneumatic hammers, and aims to provide means, as hereinafter set forth, to enable an operator to turn the cylinder of the hammer by one hand in a convenient manner; to prevent the flopping around of the air-hose, thereby preventing the tangling and wearing thereof; to increase the durability of the air-hose at its point of connection between one end thereof and the air-inlet nipple, and to constitute a manually-operated throttle-valve positioned in such a manner that the operator can readily open and close the valve when occasion requires without going to the necessity of removing that hand which is used to turn the cylinder of the hammer.

In pneumatic hammers now in general use the operator turns the cylinder with his right hand by grasping the air-hose near its connection with the cylinder. This operation is open to the objection that the air-hose flops around when the cylinder is turned, which, in some instances, causes the tangling of the air-hose; but in all cases when the cylinder is turned in the manner as stated it causes the air-hose to wear out quickly at the point of connection thereof with the cylinder. In addition to the foregoing it is necessary to use on the air-hose a common air-cock, which does not work very well, for the reason that the vibration of the hammer has a tendency to close the air-cock, and the operator is therefore compelled to retain his hand on it constantly to keep it open or else to constantly open the cock. In other forms of pneumatic hammers the air connections are positioned at the handle end of the cylinder, and the air is conveyed by suitable passages to the interior of the cylinder. For turning the cylinder of such form of pneumatic hammers a clamp or pin is attached to the cylinder, which is grasped by the operator. This has also been found objectionable, as the air-hose will be caused to flop around, and, furthermore, there is considerable wear at the point of connection between the hose and the device. The foregoing objections are all fully overcome by setting up a pneumatic hammer in accordance with this invention.

The invention further aims to provide a pneumatic hammer with means for the purpose set forth which shall be simple in its construction and arrangement; strong, durable, efficient in its use, imparting longevity to the air-hose; readily set up in connection with the hammer, and comparatively inexpensive to manufacture.

With the foregoing and other objects in view the invention consists of the novel construction, combination, and arrangement of parts hereinafter more specifically described, and illustrated in the accompanying drawings, wherein is shown the preferred embodiment of the invention; but it is to be understood that changes, variations, and modifications can be resorted to which come within the scope of the claims hereunto appended.

In describing the invention in detail, reference is had to the accompanying drawings, wherein like reference characters denote corresponding parts throughout both views, and in which—

Figure 1 is a side elevation of a pneumatic hammer in accordance with our invention, the cylinder of the hammer being partly broken away, and the air-hose also broken away. Fig. 2 is a longitudinal sectional view of a throttle-valve casing provided with an air-inlet nipple, said casing constituting a permanently-fixed handle for the operator to turn the cylinder of the hammer.

Referring to the drawings by reference characters, 1 denotes the cylinder of the hammer, which has a portion of the wall thereof reinforced, as at 2, and the said reinforced portion 2 has extending entirely therethrough an opening with the wall 3 thereof screw-threaded. At one end of the cylinder 1 a cap 4 is secured, and to the cap 4 is swivelly connected, as at 5, a handle 6. To lock the handle 6 to the cap 4, a latch is provided, consisting of a pair of ears 7, carried by the handle, a pair of ears 8, carried by the cap and in alinement with the ears 7, and a spring-arm 9, fixed at one end to the cap 4 and adapted to extend between the ears of the two pairs of ears, as shown in Fig. 1; and when the said arm 9 is positioned in such manner the handle 6 will be locked to the cap 4, consequently preventing the cylinder

from rotating independently of the handle. When the arm 9 is removed from between the ears 7 of the handle 6, it will be evident that the cylinder 1 can be rotated independent of the handle.

The reference character 10 denotes a throttle-valve casing positioned so as to extend at right angles with respect to the cylinder 1, and the said valve-casing 10 also constitutes a permanently-fixed handle adapted to be grasped by the operator when it is desired to turn the cylinder 1 independent of the handle. The inner end of the casing 10 has a portion of reduced diameter, as at 11, said portion 11 being exteriorly screw-threaded, and which constitutes a means for securing the casing 10 to the cylinder 1. Said screw-threaded portion 11 is adapted to extend in the opening formed in the reinforced portion 2 of the cylinder 1 and engage the screw-threads of the wall 3 of said opening, and by such arrangement it is evident that said casing is secured to the cylinder 1 and extends at right angles with respect thereto. The casing 10 in proximity to the reduced portion 11 is shouldered, thereby forming a valve-seat 12, upon which is adapted to be seated the tapered end 13 of the throttle-valve 14. The latter is positioned in the casing 10, is somewhat elongated and of a diameter to movably fit the inner face of the casing 10, but the fit is such that the valve 14 can be reciprocated when occasion so requires. When the end 13 of the valve 14 is against the seat 12, the passage 15 through the reduced portion 11 is closed. The inner end of the casing 10 has formed integral therewith a cylindrical air-inlet nipple 16, which extends at right angles with respect to the casing 10, is formed with an air-supply passage 17, which opens into the casing 10 at a point slightly removed from the seat 12 and has the air-hose 16^a connected thereto. The passage 17 is closed by the side of the valve 14, owing to the fact, as before stated, that the valve 14 is somewhat elongated. The position of the passage 17 with respect to the valve-seat 12 is such that said passage can be closed before the valve 14 engages the seat 12. The valve 14 is provided with an elongated stem 18, which is of such length as to project from the outer end of the casing 10. The inner face of the casing 10 near its outer end is shouldered, as at 19, and screw-threaded, as at 20. Upon the shoulder 19 is mounted a gasket 21, which constitutes a stop for limiting the outward movement of the valve 14. Upon the gasket 21 a packing 22 is arranged, and bearing against the packing 22 is a screw-threaded gland 23, which projects from the outer end of the casing 10 and is headed, as at 24. Through the gasket 21, packing 22, gland 23, and head 24, the valve-stem 18 extends, and the said stem projects above the head 24 of the gland 23. The outer end of the stem 18 is screw-threaded, and to the said screw-threaded end a stop-nut 25 is secured, which also constitutes a handle-piece for the stem, so that the stem can be readily grasped by the operator to shift the valve to and from its seat. The gasket 21 also acts as a means to indicate to the operator that the valve 14 has been withdrawn the necessary distance to open the passage 17 through the inlet-nipple 16.

Owing to the manner of setting up the casing 10 it is evident that it constitutes a fixed handle for rotating the cylinder independent of the handle 6, and when the operator desires to open the valve he simply pushes out with the hand that grasps the casing 10, and when he desires to close the valve the operator pushes his hand in. Consequently the operator does not have to remove that hand which he is using to turn the cylinder when it is desired to open and close the valve. The air-hose being close to the cylinder and extending in the direction in which the cylinder extends, the hose has a very little movement, as will be evident. As the hose is connected up to the inlet-nipple extending at right angles with respect to the valve-casing, it is evident that the hose does not have to be grasped when turning the cylinder as the turning movement is had by grasping the casing 10. By such operation it is evident that the point of connection between the hose and air-inlet nipple will not wear out as quickly as it would if the nipple was directly connected to the cylinder and the hose extended at right angles with respect to the cylinder as is the case with pneumatic hammers now in general use.

The valve 14 when open will remain in such position owing to the air-pressure against the working-face of the valve, and when the valve is closed it will be held in such position owing to the pressure of the air on the shoulder 14^a. The valve 14 does not fit tightly against the inner face of the casing 10, which permits enough air to leak back between the valve and the casing so that sufficient pressure will be exerted against the shoulder 14^a. This pressure retains the valve in its closed position.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A pneumatic hammer comprising a throttle-valve mechanism positioned at right angles with respect to the cylinder of the hammer, said mechanism having as a part thereof, an air-inlet nipple extending at right angles with respect thereto.

2. A pneumatic hammer comprising a throttle-valve casing secured to the cylinder thereof and extending at right angles with respect thereto, said casing provided with an air-inlet nipple extending at right angles with

respect thereto and further provided with a throttle-valve seat, a reciprocatory throttle-valve mounted in said casing and adapted to close the inner end of the casing and the inlet-nipple, and a valve-stem connected with the valve and projecting out of the casing.

3. A pneumatic hammer comprising a rotatable cylinder provided with a reinforcement, a valve-casing connected to said reinforcement and provided with a valve-seat and further provided with an air-inlet nipple extending at right angles with respect to said casing and adapted to have an air-hose connected thereto, a reciprocatory valve operating in said casing and adapted to close the inner end thereof and the said air-inlet nipple, and a stem projecting from said valve and of such length as to extend from the outer end of the casing.

4. A pneumatic hammer comprising a rotatable cylinder provided with a reinforcement, a valve-casing connected to said reinforcement and provided with a valve-seat and further provided with an air-inlet nipple extending at right angles with respect to said casing and adapted to have an air-hose connected thereto, a reciprocatory valve operating in said casing and adapted to close the inner end thereof and the said air-inlet nipple, a stem projecting from said valve and of such length as to extend from the outer end of the casing, and means within said casing for limiting the outward movement of the valve.

5. A pneumatic hammer comprising a rotatable cylinder, and a throttle-valve mechanism secured to the side of the cylinder and extending at right angles with respect to the cylinder and provided with an air-inlet nipple adapted to have an air-hose connected thereto, said throttle-valve mechanism constituting a handle for turning the cylinder.

6. A pneumatic hammer comprising a rotatable cylinder, and a throttle-valve mechanism secured to the sides of the cylinder and extending at right angles with respect to the cylinder and provided with an air-inlet nipple adapted to have the air-hose connected thereto, said throttle-valve mechanism constituting a handle for turning the cylinder and embodying means for limiting the outward movement of the valve thereof.

7. A pneumatic hammer comprising a rotatable cylinder provided with a reinforcement, and a valve mechanism connected to said reinforcement and extending at right angles with respect to the cylinder, said valve mechanism constituting a means for regulating the air-supply to the cylinder and a handle for turning the cylinder.

8. A pneumatic hammer comprising a rotatable cylinder provided with a reinforcement, and a valve mechanism connected to said reinforcement and extending at right angles with respect to the cylinder, said valve mechanism constituting a means for regulating the air-supply to the cylinder and a handle for turning the cylinder, said throttle-valve mechanism provided with means extending at right angles with respect thereto for connecting the air-supply means thereto.

9. A pneumatic hammer comprising a throttle-valve mechanism positioned at right angles with respect to the cylinder of the hammer, said mechanism having as a part thereof, an air-inlet nipple extending at right angles with respect thereto and means for limiting the movement in one direction of the valve thereof.

10. A pneumatic hammer comprising a valve mechanism extending at right angles with respect to the cylinder thereof and constituting a handle for turning the cylinder independent of the handle of the hammer and further constituting means for opening and closing a motive-fluid supply.

11. A pneumatic hammer comprising a manually-operated reciprocatory valve mechanism for opening and closing a motive-fluid supply, said mechanism connected to and projecting at right angles from the cylinder of the hammer and further constituting a handle for turning the hammer.

12. A pneumatic hammer comprising a manually-operated reciprocatory valve mechanism for opening and closing a motive-fluid supply, said mechanism connected to and projecting at right angles from the cylinder of the hammer and further constituting a handle for turning the hammer, and a motive-fluid supply connected to said mechanism and extending at right angles with respect thereto.

13. A pneumatic hammer comprising a cylinder, a handle swivelly connected to one end thereof, and a valve mechanism connected to said cylinder and extending at an angle with respect thereto, said mechanism constituting a handle for turning the cylinder independently of the handle swivelly connected to the cylinder.

14. A pneumatic hammer comprising a cylinder, a handle swivelly connected to one end thereof, a valve mechanism connected to said cylinder and extending at an angle with respect thereto, said mechanism constituting a handle for turning the cylinder independently of the handle swivelly connected to the cylinder, and an air-supply means connected to said mechanism and extending at an angle with respect thereto.

15. A pneumatic hammer comprising a cylinder, a valve-casing connected to the side thereof and extending at an angle with respect thereto, said casing provided at its inner end with an outlet opening into the interior of the cylinder and with an inlet in the side thereof communicating with a source of motive-fluid supply, and a reciprocatory valve mounted in the said casing and adapted

when moved in one direction to close said inlet and outlet and when moved in the opposite direction to open said inlet and outlet.

16. A pneumatic hammer comprising a cylinder, a valve-casing connected to the side thereof and extending at an angle with respect thereto, said casing provided at its inner end with an outlet opening into the interior of the cylinder and with an inlet in the side thereof communicating with a source of motive-fluid supply, a reciprocatory valve mounted in the said casing and adapted when moved in one direction to close said inlet and outlet and when moved in the opposite direction to open said inlet and outlet, and means within the casing for limiting the opening movement of the valve.

17. A pneumatic hammer comprising a valve mechanism extending at right angles with respect to the cylinder thereof and constituting a handle for turning the cylinder independently of the handle of the hammer and further constituting a means for opening and closing a motive-fluid supply, said valve mechanism provided with a pressure bearing-surface for retaining the valve in its closed position.

18. A pneumatic hammer comprising a manually-operated reciprocatory valve mechanism for opening and closing a motive-fluid supply, said mechanism connected to and projecting at right angles from the cylinder of the hammer and further constituting a handle for turning the hammer, said mechanism having the valve thereof automatically retained in open position by pressure and provided with a pressure bearing-surface for retaining the valve in closed position.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

CHARLES T. CARNAHAN.
JEREMIAH MURPHY.

Witnesses:
H. J. PHILLIPS,
LATIMER FOPLESS.